



SEQUENCE LISTING

RECEIVED  
APR 03 2002  
TECH CENTER 1600/2900

<110> Kawakami, Akira  
Terami, Fumihiko

<120> LOW TEMPERATURE EXPRESSION CHITINASE cDNAs AND METHOD FOR  
ISOLATING THE SAME

<130> 107156-00004

<140> US 09/534,229

<141> 2000-03-24

<160> 8



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<170> PatentIn version 3.0

<210> 1

<211> 256

<212> PRT

<213> Triticum aestivum

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Ala Val Ala Ala Gly Gly Ala Ala Ala Gln Gly Val Gly Ser Val Ile

20

25

30

Thr Arg Ser Val Tyr Ala Ser Met Leu Pro Asn Arg Asp Asn Ser Leu  
35 40 45

Cys Pro Ala Arg Gly Phe Tyr Thr Tyr Asp Ala Phe Ile Ala Ala Ala  
50 55 60

Asn Thr Phe Pro Gly Phe Gly Thr Thr Gly Ser Ala Asp Asp Ile Lys  
65 70 75 80

Arg Asp Leu Ala Ala Phe Phe Gly Gln Thr Ser His Glu Thr Thr Gly  
85 90 95

Gly Thr Arg Gly Ala Ala Asp Gln Phe Gln Trp Gly Tyr Cys Phe Lys  
100 105 110

Glu Glu Ile Ser Lys Ala Thr Ser Pro Pro Tyr Tyr Gly Arg Gly Pro  
115 120 125

Ile Gln Leu Thr Gly Arg Ser Asn Tyr Asp Leu Ala Gly Arg Ala Ile  
130 135 140

Gly Lys Asp Leu Val Ser Asn Pro Asp Leu Val Ser Thr Asp Ala Val  
145 150 155 160

Val Ser Phe Arg Thr Ala Met Trp Phe Trp Met Thr Ala Gln Gly Asn  
165 170 175

Lys Pro Ser Cys His Asn Val Ala Leu Arg Arg Trp Thr Pro Thr Ala  
180 185 190

Ala Asp Thr Ala Ala Gly Arg Val Pro Gly Tyr Gly Val Ile Thr Asn  
195 200 205

Ile Ile Asn Gly Gly Leu Glu Cys Gly Met Gly Arg Asn Asp Ala Asn  
210 215 220

E!  
cont

Val Asp Arg Ile Gly Tyr Tyr Thr Arg Tyr Cys Gly Met Leu Gly Thr  
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<212> PRT

<213> Triticum aestivum

<400> 2

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Leu Ala Ala Ala Ala Val Thr Pro Ala Thr Ala Glu Gln Cys Gly Ser  
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Gln Ala Gly Gly Ala Lys Cys Ala Asp Cys Leu Cys Cys Ser Gln Phe  
             35            40            45

Gly Phe Cys Gly Thr Thr Ser Asp Tyr Cys Gly Pro Arg Cys Gln Ser  
             50            55            60

Gln Cys Thr Gly Cys Gly Gly Gly Gly Gly Val Ala Ser Ile Val  
65            70            75            80

Ser Arg Asp Leu Phe Glu Arg Phe Leu Leu His Arg Asn Asp Ala Ala  
             85            90            95

Cys Leu Ala Arg Gly Phe Tyr Thr Tyr Asp Ala Phe Leu Ala Ala Ala  
             100            105            110

Gly Ala Phe Pro Ala Phe Gly Thr Thr Gly Asp Leu Asp Thr Arg Lys  
             115            120            125

E!  
Cmt

Arg Glu Val Ala Ala Phe Phe Gly Gln Thr Ser His Glu Thr Thr Gly  
130 135 140

Gly Trp Pro Thr Ala Pro Asp Gly Pro Phe Ser Trp Gly Tyr Cys Phe  
145 150 155 160

Lys Gln Glu Gln Gly Ser Pro Pro Ser Tyr Cys Asp Gln Ser Ala Asp  
165 170 175

Trp Pro Cys Ala Pro Gly Lys Gln Tyr Tyr Gly Arg Gly Pro Ile Gln  
180 185 190

Leu Thr His Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Val  
195 200 205

Asp Leu Leu Asn Asn Pro Asp Leu Val Ala Thr Asp Pro Thr Val Ala  
210 215 220

Phe Lys Thr Ala Ile Trp Phe Trp Met Thr Thr Gln Ser Asn Lys Pro  
225 230 235 240

Ser Cys His Asp Val Ile Thr Gly Leu Trp Thr Pro Thr Ala Arg Asp  
245 250 255

Ser Ala Ala Gly Arg Val Pro Gly Tyr Gly Val Ile Thr Asn Val Ile  
260 265 270

Asn Gly Gly Ile Glu Cys Gly Met Gly Gln Asn Asp Lys Val Ala Asp  
275 280 285

Arg Ile Gly Phe Tyr Lys Arg Tyr Cys Asp Ile Phe Gly Ile Gly Tyr  
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Gly Asn Asn Leu Asp Cys Tyr Asn Gln Leu Ser Phe Asn Val Gly Leu  
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Pro Asn Cys Leu Cys Cys Ser Lys Phe Gly Phe Cys Gly Thr Thr Ser

35 40 45

Asp Tyr Cys Gly Thr Gly Cys Gln Ser Gln Cys Asn Gly Cys Ser Gly

50 55 60

Gly Thr Pro Val Pro Val Pro Thr Pro Ser Gly Gly Gly Val Ser Ser

65 70 75 80

Ile Ile Ser Gln Ser Leu Phe Asp Gln Met Leu Leu His Arg Asn Asp

85 90 95

Ala Ala Cys Leu Ala Lys Gly Phe Tyr Asn Tyr Gly Ala Phe Val Ala

100 105 110

Ala Ala Asn Ser Phe Ser Gly Phe Ala Thr Thr Gly Ser Thr Asp Val

115 120 125

Lys Lys Arg Glu Val Ala Ala Phe Leu Ala Gln Thr Ser His Glu Thr

130 135 140

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cont

Thr Gly Gly Trp Pro Thr Ala Pro Asp Gly Pro Tyr Ser Trp Gly Tyr  
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Cys Phe Asn Gln Glu Arg Gly Ala Thr Ser Asp Tyr Cys Thr Pro Ser  
165 170 175

Ser Gln Trp Pro Cys Ala Pro Gly Lys Lys Tyr Phe Gly Arg Gly Pro  
180 185 190

Ile Gln Ile Ser His Asn Tyr Asn Tyr Gly Pro Ala Gly Gln Ala Ile  
195 200 205

Gly Thr Asp Leu Leu Asn Asn Pro Asp Leu Val Ala Ser Asp Ala Thr  
210 215 220

Val Ser Phe Lys Thr Ala Leu Trp Phe Trp Met Thr Pro Gln Ser Pro  
225 230 235 240

Lys Pro Ser Ser His Asp Val Ile Thr Gly Arg Trp Ser Pro Ser Gly  
245 250 255

Ala Asp Gln Ala Ala Gly Arg Val Pro Gly Tyr Gly Val Ile Thr Asn  
260 265 270

Ile Ile Asn Gly Gly Leu Glu Cys Gly Arg Gly Gln Asp Gly Arg Val  
275 280 285

Ala Asp Arg Ile Gly Phe Tyr Lys Arg Tyr Cys Asp Leu Leu Gly Val  
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Ser Tyr Gly Asp Asn Leu Asp Cys Tyr Asn Gln Arg Pro Phe Ala  
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<222> (1)..(23)  
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<222> 12, 18  
<223> n can be one of a,c,t, or g

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23

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<221> misc\_feature  
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<220>  
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<223> n can be one of a,c,t, or g

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<211> 771

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<213> Triticum aestivum

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ctgccaacc gcgacaactc gctgtgccc gccagagggt tctacacgta cgacgccttc 180

atcgccgccg ccaacacctt cccgggcttc ggcaccaccg gcagcgccga cgacatcaag 240

cgcgacctcg ccgccttctt cggccagacc tcccacgaga ccaccggagg gacgagaggc 300

gctgccgacc agttccagtg gggctactgc ttcaaggaag agataagcaa ggccacgtcc 360

ccaccatact atggacgggg acccatcaa ttgacagggc ggtccaacta cgatcttgcc 420

gggagagcga tcgggaagga cctggtgagc aaccagacc tagtgtccac ggacgcggtg 480

gtgtccttca ggacggccat gtggttctgg atgacggcgc agggaaacaa gccgtcgtgc 540

E1  
cont



cacaacgtcg ccctacgccg ctggacgccg acggccgccg acaccgctgc cggcagggta 600

cccggatacg gagtgatcac caatatcatc aacggcgggc tcgagtgcgg aatgggccgg 660

aacgacgcca acgtcgaccg catcggctac tacacgcgct actcggcat gtcggcacg 720

gccaccggag gcaacctga ctgtacacc cagaggaact tcgctagcta g 771

<210> 7

<211> 972

<212> DNA

<213> Triticum aestivum

<220>

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<222> (1)..(972)

<223> cDNA

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gactgcctgt gctgcagcca gttcgggttc tgcggcacca cctccgacta ctgcggcccc 180

cgctgccaga gccagtgcac tggctcggtt ggcggcggcg gcggggtggc ctccatcgtg 240

tccagggacc tcttcgagcg gttcctgctc catcgcaacg acgcagcgtg cctggccccg 300

gggttctaca cgtacgacgc ctcttggcc gccgcggcg cgttcccggc cttcggcacc 360

accggagacc tggacacgcg gaagcgggag gtggcggcct tcttcggcca gacctctcac 420

gagaccaccg gcgggtggcc caccgcgccc gacggcccct tctcatgggg ctactgttc 480

E!  
Cont

aagcaggagc agggctcgcc gccgagctac tgcgaccaga gcgccgactg gccgtgcgca 540

cccggcaagc agtactatgg ccgcggtccc atccagctca cccacaacta caactacgga 600

ccggcggggc gcgcaatcgg ggtggacctg ctgaacaatc cggacctggt ggccacggac 660

ccgacagtgg cgtcaagac ggcgatatgg ttctggatga cgacgcagtc caacaagccg 720

tcgtgcatg acgtgatcac ggggctgtgg actccgacgg ccagggatag cgagccgga 780

cggttaccgc ggtatggtgt catcaccaac gtcatcaacg gcgggatcca atgcggcatg 840

gggcagaacg acaagggtggc ggatcgatc gggttctaca agcgctattg tgacattttc 900

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gcggcacagt ga

972

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<211> 960

<212> DNA

<213> Triticum aestivum

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<223> cDNA

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E1  
Cont

ttcggtttct gcggcaccac ctccgactac tgcggcaccg gctgccagag ccagtgaat 180

ggctgcagcg gcggcacccc ggtaccggtg ccgacccct cggcgggcg cgtctctcc 240

attatctgc agtcgtctt cgaccagatg ctgctgcacc gcaacgacgc ggcgtgcctg 300

gccaaaggggt tctacaacta cggcgccctc gtcgccgccc ccaactcgtt ctggggcttc 360

gcgaccacag gtagcaccga cgtcaagaag cgcgaggtgg ccgcttct cgtcagact 420

tcccacgaga cgaccggcgg gtggccgacg gcgcccacg gccctactc ctggggctac 480

tgcttaacc aggagcgcg cgccacctcc gactactgca cgccgagctc gcagtggcca 540

tgtgcgccg gcaagaagta cttcgggcgc gggcccatcc agatctaca caactacaac 600

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tcggacgca ccgtgtcgt taagacggcg ttgtgttct ggaagacgc gcaatcacc 720

aagccttga gccacgacgt gatcacgggc cgtggagcc cctcgggcgc cgaccaggcg 780

gcggggaggg tgctgggtg cgtgtgatc accaactca tcaacgggtg gctcgagtgc 840

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ctcctggcg tcagctacg tgacaacctg gactgctaca accaaaggcc gttcgcatag 960

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E1  
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